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10/525,754

09/26/2005

Kazunari Fujiyama

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EXAMINER

LAU, TUNG S

ART UNIT

PAPER NUMBER

2863

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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3 MONTHS

12/19/2006

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/525,754

Applicant(s)

FUJIYAMA ET AL.

Examiner

Tung S. Lau

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 11 is/are rejected.
- 7) ☒ Claim(s) 4-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/26/2005, 04/12/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification objections***

1. The abstract has more than 150 words, correction is required. See 37 CFR 1.72(b) and MPEP § 608.01(b). 'Comprises' is an improper legal phraseology often used in patent claims and should be avoided. (MPEP 608.01(b) [R-3]). Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited See 37 CFR 1.72(b) and MPEP § 608.01(b). The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.  
  
The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "means" and "said," etc, should be avoided

### **Joint inventor**

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered

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therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### **Information Disclosure Statement**

3. Information Disclosure Statement filed on 09/26/2005 and 04/12/2006 are acknowledged by the examiner; A copy of a signed PTO-1449 attached with this office action.

### **Priority**

4. Receipt is acknowledged of paper submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Shigemitsu Kihara (Maintenance Technique using RBI/RBM, Publish December 2000).

**Regarding claim 1:**

Shigemitsu Kihara describes an operation-supporting apparatus for plant equipment, comprising : an operation request input unit that inputs information relating to operation request items of the plant equipment (page 1 of the translation, lines 19-25); an operating conditions setting unit that converts operation request input information (page 1 of the translation, lines 1-18, specially the RBI/RBM unit), input by the operation request input unit, to operating parameters (page 1 of the translation, lines 1-18, specially the RBI/RBM unit); an operation history creation unit that creates an operation history by chronologically processing the operating parameters (page 4 of the translation, section 3-2), converted by the operating conditions setting unit (page 5 of the translation, table 1), based on input from an operation monitoring unit (page 3 of the translation, lines 15-21) that monitors operating states of the plant equipment (page 5 of the translation, table 1); a breakdown statistics database that stores an event tree of the plant equipment in correlation with degrees of unreliability relating to breakdown events (page 5 of the translation, table 1); an event simulator that calculates the degree of unreliability corresponding to the operating parameters (page 5 of the translation, table 1), based on the information in the breakdown statistics database, the operation request information (page 5 of the translation, table 1), and the operation history Information (page 4 of the translation, section 3-2), and in compliance with the event tree of the plant equipment (page 5 of the translation, table 1); a risk-cost

calculation unit that calculates risk-cost by determining the aggregate product of the degrees of unreliability (page 5 of the translation, table 1), and restoration costs in compliance with the event tree (page 4 of the translation, section 3-2); an operating method determination unit that determines whether operating conditions are suitable by comparing the risk-cost (page 4 of the translation, section 3-2) with profit that is expected to be gained by continuing operation (page 4 of the translation, section 3-2); and an operating method specification unit that specifies specific operation conditions for the plant equipment. In accordance with the operating method determined by the operating method determination unit (page 77, fig. 1, page 79, fig. 2).

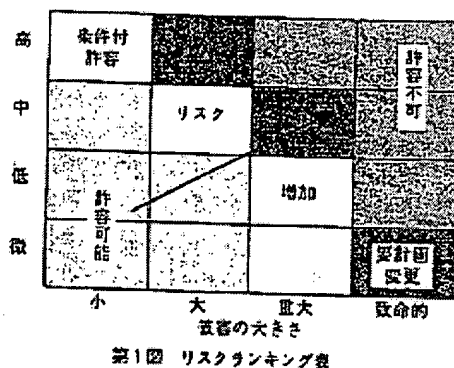
**Table 1 Risk Ranks and Necessary Measures**

| <b>Risk ranking</b>             | <b>Necessary measure</b>   |
|---------------------------------|--|
| <b>Acceptable</b>               | No measure such as an inspection other than a legal inspection is required during an object evaluation period.   |
| <b>Conditionally acceptable</b> | The plant is continuously usable upon appropriate checking at inspection.  |
| <b>Plan change required</b>     | Lower a rank after executing any one of the following processes until a next inspection. <ul style="list-style-type: none"><li>• Improvement of inspection procedures</li><li>• Improvement of a method of operation or management</li><li>• Online monitoring</li><li>• Measure for reducing a damage</li></ul> |
| <b>Unacceptable</b>             | Immediately lower a risk rank by the above method.   |

**Regarding claim 2,** Shigemitsu Kihara further describes the operation monitoring unit includes detectors that detect all or some of the temperature and pressure (page 4 of the translation, section 3-2) of operational fluids of plant equipment (page 1 of the translation, lines 33-36), number of rotations of

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rotating parts, and output load, chronologically processes the detected signals (page 4 of the translation, section 3-2), arranges regular and irregular operations into predetermined categories, and collects and stores data that relates to number of start-ups and operating times.



Regarding claim 3, Shigemitsu Kihara further describes the breakdown statistics database uses an event tree (page 4 of the translation, section 3-3), that is based on previous breakdown events in the plant (page 1 of the translation, lines 33-36) and/or other similar plants and relates to cracks, deformation, erosion, abrasion, oxidation, corrosion, deterioration of materials, breakage, reduced capability, and functional deterioration, and a degree of unreliability function for each event, these being expressed as a function of material lifetime parameters in correspondence with operation conditions, or as a function of parameters of temperature, stress, warping, and environmental factors, that represent operating conditions.

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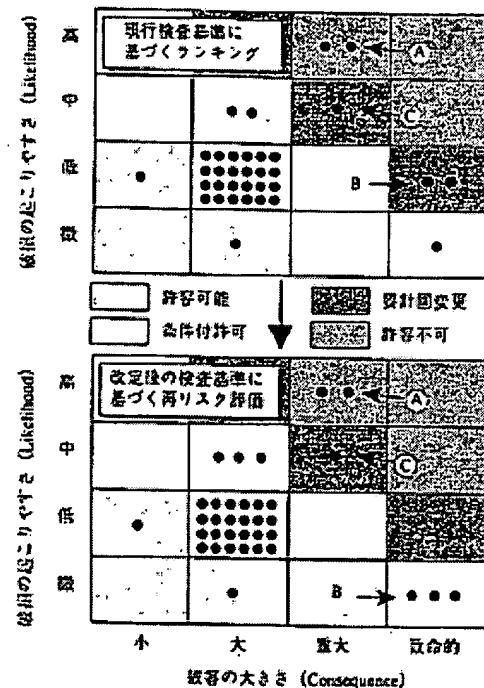


図2 600MWボイラ再熱器で行った各部位のリスクランキング結果 (上: 現状検査基準, 下: 改訂検査基準)

### Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shigemitsu Kihara (Maintenance Technique using RBI/RBM) in view of Hida Tomoyuki (Japan Publication 2000-259222).

#### Regarding claim 11:

Shigemitsu Kihara further describes information from a plurality of the operation monitoring units and the breakdown monitoring units, provided for respective



plants and information output from a plurality of the operating method determination units, provided for respective plants, are transmitted (page 3 of the translation,3). Shigemitsu Kihara does not describes via a network, Hida Tomoyuki describes via a network (abstract, specially using LAN), in order to be able to communicate outcome fast and accurately (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shigemitsu Kihara to have via a network taught by Hida Tomoyuki in order to be able to communicate outcome fast and accurately.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Shigemitsu Kihara and Hida Tomoyuki are analogous art because they are from the same field of endeavor, device and method of monitor and preventive maintenance system.

***Allowable Subject Matter***

7. Claims 4-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4:

when not Immediately stopping operation, the probability Of an event that already occurred in the event tree stored in the breakdown statistics database is corrected from a pre-event probability to a post-event probability, and in addition, a subsequent event is corrected by using the post-event probability of the event that already occurred, and the event simulator uses a corrected degree of unreliability.

Claim 5 is objected due to their dependency on claim 4.

Regarding claim 6:

information relating to the occurrence of breakdown events and precursory breakdown events detected by the inspection unit is transmitted to the breakdown statistics database, a degree of unreliability function is corrected to post-event probability, and, In cases where the operating method determination unit determines that operation cannot restart and that operation

is possible only under certain conditions, a repair method is selected, the degree of unreliability in the breakdown statistics database being changed when the repairs have been carried out, another simulation is executed and the operating method determination unit makes a determination.

Claim 7 is objected due to their dependency on claim 6.

Regarding claim 8:

probability theory lifetime evaluation unit that calculates a lifetime evaluation by appending probabilities to lifetimes of plant equipment with respect to creeping and fatigue by using material lifetime characteristics stored beforehand in a statistical material database, and the probability, a degree of unreliability function being calculated from the lifetime evaluation, determined by the probability theory lifetime evaluation unit, stored in the breakdown statistics database, and used in calculations made by the event simulator.

Claims 9 and 10 are objected due to their dependency on claim 8.

#### **Contact information**

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

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John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tung S. Lau  
AU 2863, Patent examiner  
December 13, 2006